

Declaration by M. Jöhnck
In re application of Eisenbeiss et al.
Serial No.: 10/009,486

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Eisenbeiss et al.

Serial No.: 10/009,486

Filed 12/13/2001

For: MINIATURIZED ANALYTICAL SYSTEM

Group Art Unit: 1753
Examiner: Olsen, Kaj K.

CERTIFICATION OF MAILING

I hereby certify that this correspondence is being deposited with the U.S. Postal Services as First Class Mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: March 15, 2004

Name:

Sharon McDaniel

Signature:

MILLEN, WHITE, ZELANO & BRANIGAN, P.C.

DECLARATION

Honorable Commissioner of
Patents and Trademarks
Washington, D.C., 20231

MADAM/SIR:

The Declarant, Matthias Jöhnck, being duly warned, declares and says:

THAT he is a German citizen, residing at Dortmund, Germany;

THAT he is a chemist having studied at the University of Dortmund, Germany, from 1989 to 1995;

THAT he graduated from the University of Dortmund, Germany, in 1995;

THAT he worked on his doctoral thesis at the University of Dortmund from 1996-1999 and obtained the Dr. degree from the University of Dortmund in 2000;

THAT he worked from 1992 to 1999 in the microstructure technology group within the electrical engineering department at the University of Dortmund;

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THAT in 2000, he joined the Research and Development Department, Section Scientific Laboratory Products, of MERCK, Darmstadt, Germany;

THAT since 1992, he has been working in the field of polymer materials focused on synthesis and characterization of adhesives as well as microstructure technology and polymer bonding procedures for producing microstructured analytical systems;

THAT he is author or co-author of more than 35 scientific articles in the field of polymer materials as well as microstructure technology and bonding polymers for producing and application of microstructured analytical systems;

THAT he is familiar with the subject matter of the invention disclosed and claimed in U.S. Patent Application Ser. No. 10/009,486, by Eisenbeiss et al. (hereinafter referred to as APPLICATION) of which he is a co-inventor;

THAT he is familiar with the subject matter disclosed in the cited references, among which are US 6,375,871, WO 98/45693, WO 98/32535, US 6,406,583 and WO 98/09161;

THAT the process for producing microstructured units comprising a base plate and a cover layer according to Bentsen et al. (US 6,375,871) is a continuous process. Figure 8 (and column 9, lines 29-36) show how the cover layer is combined with the base plate. The cover substrate 58 is laminated to article 64 between rollers 60 and 66. This means, the microstructured article and the cover layer are first contacted at one edge and are then pressed together starting from that edge until the whole article is covered by the cover layer.

If the cover layer and the microstructured article are joined at an angle (see Figure 8 of Bentsen), the adhesive is pressed from the edge at which the two elements are first contacted to those parts of the elements where there is no contact yet. One can describe this as a kind of adhesive "wave" that wanders in front of the contact line thus pressing adhesive in the channel sections in front of the contact line. Consequently, parts of the channels system are inevitably covered with adhesive.

Bentsen et al. do not mention this problem or do not see that this could negatively influence the function of the microstructured system. Nevertheless, it is important for the analytical performance that none of the walls of the channels system comprises

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highly reactive plastic, i.e. remains of adhesive or that the channel walls consist of different materials.

THAT the procedure according to the present invention – combining specific methods for applying the adhesive and a sophisticated aligning and parallel joining of the two elements – ensures the production of microstructured systems without any adhesive wetting the walls of the channel system.

THAT the optical markers disclosed in the present invention (e.g. Fig. 4) can only be used when the two elements are joined in parallel.

THAT none of the documents of prior art discloses the use of sputtered optical markers. As disclosed on page 15, lines 32-38, of the present invention, the optical markers can be sputtered on the component in the same process step as the electrodes. This ensures that the electrodes as well as the optical markers are introduced with high accuracy and that no further expenditure is necessary for introducing the optical markers.

THAT Bentsen et al. disclose an adhesion layer of chromium oxide and WO 98/09161 discloses the use of platinum and gold as electrode materials. Nevertheless, a person skilled in the art would not have combined the disclosure of these two documents as neither Bentsen nor WO 161 give any hint that it could be favorable to have an adhesive coating of chromium oxide which supports the adhesion of noble metal electrodes. It is known in the art that noble metal electrodes do not reliably adhere to plastic substrates. It is further known that in contrast to noble metals, copper easily adheres most substrates. Thus, the use of a chromium oxide layer in combination with copper in Bentsen gives no hint about the effect of a chromium oxide layer in combination with noble metals. It could not be foreseen that a chromium oxide layer drastically improves the adherence of noble metals on plastic substrates. Prior to this finding it was nearly impossible to make noble metal electrodes reliably adhere to plastic supports – especially in microstructured analytical systems where the electrodes are very small and thin and where the electrophoretic conditions (high voltage, buffers etc.) additionally weaken the adherence of the electrodes.

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The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the APPLICATION or any patent issuing thereon.

Done, this March 04, 2004 at Darmstadt, Germany



Dr. Matthias Jöhnck